Engagement Opportunities in NASA STEM (EONS)
FY23 NASA Research Announcement (NRA) NNH23ZHA001N-MCA

MUREP Curriculum Awards (MCA)

Title: Developing NASA-infused Curriculum and Experiential Research for Student Success in Space Technology

Institution: University of the District of Columbia

City/State: Washington, DC

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In response to the urgent needs for engineering professionals capable of crossing disciplinary boundaries to address the NASA challenges in the space exploration, this MUREP Curriculum Awards (MCA) Project at the University of the District of Columbia (UDC), a HBCU, seeks to establish a multi-layered innovative and integrated space technology experiential learning program to infuse NASA-focused coursework and research training in space technology into engineering education and engage students at both UDC and UDC Community College (UDC-CC). The project is expected to improve UDC students' preparation and success toward a NASA-relevant engineering career and/or an advanced degree in space technology. With the recent launching of the Artemis mission and overall Moon to Mars strategy, NASA has a strong need to build a diverse and competent STEM workforce for the current and future mission success. The project aims to train a diverse new generation of engineering workforce with NASA-focused knowledge and skills in the space technology and improve the preparation and success of students, especially those from populations traditionally underrepresented in STEM disciplines for an engineering career and/or advanced degree related to the NASA field to meet the workforce needs for the space exploration.

The objectives of this project are as follows: 1): Integration: to update the educational experiences in Engineering Programs at Bachelor and Associate Degree levels at UDC and UDC-CC by developing NASA-infused courses; 2): Enrichment: to enrich the undergraduate experiential research experience through creation of an interdisciplinary project-based summer intern program that offers students with NASA and research university experience focusing on space technology ; 3): Enhancement: to enhance the teaching effectiveness and student engagement by providing faculty professional development workshop and training on culturally relevant and responsive instruction and upgrading the STEM laboratory and the equipment and materials for the new and revised course offerings; 4): Exposure: to increase the enrollment and retention rate of NASA-infused engineering programs at UDC (including UDC-CC) through engaging students and outreach to local high schools and community colleges for a diverse future NASA-relevant workforce. This project will have a broader impact on exposure of UDC students with new interdisciplinary NASA-focused educational experiences and culturally relevant and

responsive instruction. The project is expected to enhance students' interests, persistence and success in the engineering fields that will contribute to a diverse engineering workforce for next-generation of space exploration. The project will also enhance the research skills and research training in space technology for undergraduate students through cutting-edge research and internship opportunities. The project will contribute to the knowledge that how to infuse the NASA-focused content and experimental learning into engineering programs and serve as an exemplary model that can be adopted by other institutions.

The project is aligned with the CoSTEM Pathway 2 to engage students where discipline converges and promotes transdisciplinary learning. A variety of NASA-focused activities such as NASA-focused coursework, projects, workshops, student competitions, and research training and internships are proposed to encourage students' affiliation with NASA through their academic careers, which is aligned with NASA's Strategic Plan to build the next generation of diverse explorers. These educational activities are also aligned with STEM Engagement's priority by providing students with NASA-related work experience and experiential learning opportunities to promote students' interests and build a diverse future STEM workforce in space technology.